Translation

PCT/EP2003/000212

PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference A 14430-PCT	FOR FURTHER ACTION	See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)
International application No. PCT/EP2003/000212	International filing date (*day/month/year*) 11 January 2003 (11.01.2003)	Priority date (*day/month/year*) 11 March 2002 (11.03.2002)
International Patent Classification (IPC) or national classification and IPC H05K 7/20		
Applicant RITTAL GMBH & CO. KG		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.

2. This REPORT consists of a total of 4 sheets, including this cover sheet.

   ☒ This report is also accompanied by ANNEXES, i.e., sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

   These annexes consist of a total of 5 sheets.

3. This report contains indications relating to the following items:

   - I ☒ Basis of the report
   - II ☐ Priority
   - III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
   - IV ☐ Lack of unity of invention
   - V ☒ Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
   - VI ☐ Certain documents cited
   - VII ☐ Certain defects in the international application
   - VIII ☐ Certain observations on the international application

Date of submission of the demand	Date of completion of this report
03 April 2003 (03.04.2003)	22 January 2004 (22.01.2004)
Name and mailing address of the IPEA/EP Facsimile No.	Authorized officer Telephone No.

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.
PCT/EP2003/000212

I. Basis of the report

1. With regard to the **elements** of the international application:*

☐ the international application as originally filed

☒ the description:

pages 4, 5, as originally filed
pages _____, filed with the demand
pages 1-2, filed with the letter of 27 October 2003 (27.10.2003)

☒ the claims:

pages _____, as originally filed
pages _____, as amended (together with any statement under Article 19
pages _____, filed with the demand
pages 1-7, filed with the letter of 27 October 2003 (27.10.2003)

☒ the drawings:

pages 1, as originally filed
pages _____, filed with the demand
pages _____, filed with the letter of _____

☐ the sequence listing part of the description:

pages _____, as originally filed
pages _____, filed with the demand
pages _____, filed with the letter of _____

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.
These elements were available or furnished to this Authority in the following language _____ which is:

☐ the language of a translation furnished for the purposes of international search (under Rule 23.1(b)).
☐ the language of publication of the international application (under Rule 48.3(b)).
☐ the language of the translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

☐ contained in the international application in written form.
☐ filed together with the international application in computer readable form.
☐ furnished subsequently to this Authority in written form.
☐ furnished subsequently to this Authority in computer readable form.
☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. ☐ The amendments have resulted in the cancellation of:

☐ the description, pages _____
☐ the claims, Nos. _____
☐ the drawings, sheets/fig _____

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).**

* *Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rule 70.16 and 70.17).*

** *Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.*

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.
PCT/EP 03/00212

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Claims	1-7	YES
	Claims		NO
Inventive step (IS)	Claims	1-7	YES
	Claims		NO
Industrial applicability (IA)	Claims	1-7	YES
	Claims		NO

2. Citations and explanations

The invention relates to a cooling array. The document US-A-4 514 746 (D1) discloses all the features of the preamble of claim 1, but not the features of the characterizing portion of this claim.

Claim 1 is therefore novel.

The coupling connections of the characterizing portion of claim 1 are not suggested by the searched prior art. Consequently, claim 1 appears to comply with the PCT requirements for inventive step.

Dependent claims 2-7 relate to modifications of claim 1 and are therefore also novel and inventive.

New Specification Section

(replaces pages 1 to 3 of the original specification)

The invention relates to a cooling array with a housing receiving built-in electrical components and with an air conditioning arrangement, which is connected with a heat source of the built-in electrical components via a coolant-conducting inflow line and an outflow line, that several component inlet lines branch off the inflow line and several component outflow lines branch off the outflow line, wherein at least one component inlet line and at least one component outflow line is assigned to a built-in electrical component, wherein an inlet line and a return flow line branch off the air conditioning arrangement and are connected to the inflow line and the outflow line.

A cooling arrangement of this type is known from USP 4,514,746. With this known structure the individual lines, which the connection with the air conditioning device and the consumers,

i.e. the built-in electrical components which are to be cooled, represent a complete system which is designed for a clearly defined number of built-in components. It is therefore not possible to change the structure of the cooling arrangement in a simple manner and to reduce and/or increase the number of built-in components.

For obtaining a flexible cooling arrangement the invention provides that the connectors are constituted by coupling devices, and that the coupling connections are embodied as couplings which can be separated or joined in a dripless manner, that the inflow lines and/or the outflow line is embodied as rigid profiled legs and constitute a a guide channel for the coolant, for example water.

The built-in electrical components can be individually connected or disconnected by means of these coupling devices without not interfering with the remaining circulation of the other built-in components in the cooling arrangement. Moreover, the inflow and/or outflow lines embodied as rigid profiled legs with guide phases for the coolant can easily be embedded in the switchgear cabinet and are available as connecting options for built-in electrical components over the entire height of the switchgear cabinet.

The inflow and the outflow lines are connected with an air conditioning arrangement, which can be an installation operating in accordance with the evaporation principle.

The component inlet and outflow lines have coupling elements at their ends, which can be joined with correspondingly designed counter-coupling elements to constitute coupling connections.

New Claims 1 to 7

(replace original claims 1 to 10)

1. A cooling array with a housing (10) receiving built-in electrical components (11) and with an air conditioning arrangement, which is connected with a heat source of the built-in electrical components via a coolant-conducting inflow line (22) and an outflow line (26), that several component inlet lines (27) branch off the inflow (22) line and several component outflow lines (23) branch off the outflow line (26), wherein at least one component inlet line (27) and at least one component outflow line (23) is assigned to a built-in electrical component (11), wherein an inlet line (20) and a return flow line (29) branch off the air conditioning arrangement, which are connected to the inflow line (22) and the outflow line (26),

characterized in that

the connections are constituted by coupling connections (21), and

the coupling connections are embodied as couplings which can be separated and joined without dripping,

the inflow line (22) and/or the outflow line (26) are embodied as rigid profiled legs, which form a guide channel for the coolant, for example water.

2. The cooling array in accordance with claim 1,

characterized in that

the component inlet (27) and the component outflow lines (23) have connecting elements at their ends, which can be joined together with corresponding counter-connecting elements to form coupling connections (28).

3. The cooling array in accordance with claim 1 or 2,

characterized in that

the housing (10) is a switchgear cabinet, whose rear area constitutes a receiving space for the vertically extending inflow line (22) and outflow line (28).

4. The cooling array in accordance with claim 3,

characterized in that

in the roof area of the housing (10) the inflow line (22) makes a transition into the outflow line (26) via a connecting line (25), and

a ventilating device (24) is integrated into the connecting line (25).

5. The cooling array in accordance with one of claims 1 to 4, characterized in that

the amount of coolant conducted to the built-in electrical components (11) can be controlled by means of a governor (30) integrated into the component inlet line (27) or the component outflow line (23).

6. The cooling array in accordance with one of claims 1 to 5, characterized in that
the profiled leg is embodied as an extruded profiled section.

7. The cooling array in accordance with one of claims 1 to 6, characterized in that
the housing (10) has a support frame with vertical profiled sections, and
the inflow line (22) and/or the outflow line (26) is integrated into at least one profiled section.